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A Tribute to the People of California

DEPARTMENT OF OBSTETRICS & GYNECOLOGY
SCHOOL OF MEDICINE

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August 11, 1970

Dr. A. A. Benson
Chairman, Research Council
San Diego Zoological Society
Scripps Institution of Oceanography
Marine Bioloby Research Division
La Jolla, California 92037

Dear Dr. Benson:

I am responding to your memorandum of July 31 concerning the desirability of setting up a cell bank. As you know, this is of very great concern to me and I hope that we can somehow proceed. I am going to summarize what I can contribute to the subject.

Rationale

A number of mammals and other species are going to become extinct in the next decades, all efforts notwithstanding. (Rhino species, some whales, some antelopes, some apes and monkeys, etc.) Dr. J. Lederberg and I feel strongly that an effort should be made to save materials from these animals so that scientists of the future (say 50 years hence) may have the ability to study their genome with (then) more sophisticated techniques. At present it is only feasible to freeze tissue cultures, blood and serum. I know most about the first procedure which we have practiced and a start might be made with this. These tissues become available only sporadically and hence an effort should be made to commence collection now in a safe fashion.

Procedure

At liquid nitrogen temperature (-196°) it is possible to freeze in small ampoules (with glycerol or DMSO) propagated tissue cultures, usually fibroblasts. These have an indefinite life span and, from consultation with several experts, there is no reason to believe that liquid helium is needed. At least five vials should be frozen. A knowledgeable committee (tissue culture experts and taxonomists) should establish a log book (to collect all information possible on the animal) and make the decision what to freeze. Probably a national committee needs to supervise the (future) activity of the wisdom of unfreezing, i.e. distribution for scientific usage.

The most costly item is a perpetual nitrogen freezer that makes its own nitrogen. In discussion with "Cryogenic Technology, Inc." in Boston, they would be able to construct such a unit to specifications. It could run without electricity for one week without loosing the nitrogen. It could have an emergency generator attached. The cost might be $25,00 - 40,000. They are interested in helping.

The freezing laboratory should be set up near the bank. Ideally it would be made up of one scientist plus one technician. They would screen for PPLO, purity of karyotypes and various other items, in addition to doing their own scientific work and primary culture. A semen specialist might be considered for the future. A small tissue culture laboratory only would be required for such undertaking. Some means for perpetuating such a laboratory must be kept in mind. Now most valuable cultures are lost or intentionally discarded.

Locality

Several institutions have been approached. Thus, the Museum of Natural Science in New York has given cogent reasons why it should not accept such a facility. Dr. Ripley and his staff at Smithsonian in Washington are willing to accept the bank but there is no genuine interest and all would have to be accomplished through long distance committee. The perpetuity of the Type Tissue Culture Committee may be O.K. but no real interest has been evinced.

Placing it at San Diego Zoo would have many advantages and it would be a "stone in their crown". It would have various expertise handy. Good relations exist to Sea World and its sea mammals. It is as perpetual as any museum. It is in constant contact with the endangered species and keeps many in its confines. It has wide contacts and has a reputation for scientific endeavors and conservation. It has a research building. By establishing such a facility it could reinforce its leadership in conservation efforts by appropriate announcements.

Support

I suspect an initial donor to establish the laboratory might be found. Dr. Herman Lewis of the NSF has indicated in correspondence that the NSF might be willing to accept a proposal since he is aware of the urgency. Of course their funds are small but with conservation being a high priority item under the current administration perhaps one can get somewhere.

The IUCN (Dr. Holloway, June 9, 1970 Morges, Switzerland) has formally accepted the desirability of the proposal and wishes to make its officers and any help available in collecting material from vanishing animals. Their intellectual support, as well as their collecting help will be invaluable. They would like to begin now.

We have frozen ca. 30 species now and Dr. Hsu probably as many. I will transfer mine in September from Hanover to San Diego in a portable freezer that needs constant refilling.

A number of scientists are waiting to give active help, e.g. David Bloch (Cell Research Institute, Austin, Texas), T. C. Hsu (Houston, Texas). Dr. Doris Wurster, an accomplished mammalian cytogeneticist and tissue culturist who remained at Dartmouth after I left would be a superb person to head such a project. I think she could be attracted here.

Criticism

Such a facility of course will do nothing to "save" species. It has been said that it should be done quietly, so as not to compete with the real conservation efforts. Of course these arguments are correct. But if the bank is not established, soon many chances of preservation will be forever lost, in the next 3 - 5 years alone.

Cost

The initial equipment should be no more than $50,000. An annual service contract for the freezer would be minimal (less than $1,000.). The expense would be the maintenance of a laboratory personnel (one scientist, one to two technicians) and ca.$10,000 supplies.

The next steps

Creation of a committee, arrival of exact cost figures, obtaining the funds.

Respectfully yours,

Kurt Benirschke, M.D.

KB:dmj

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